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TABLEWARE DRYER
[Shokki kansouki]

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TITLE (54) : TABLEWARE DRYER

FOREIGN TITLE (54A) : SHOKKI KANSOUKI

1. Title of the Invention

Tableware Dryer

2. Claim

1. A tableware dryer equipped with:

an electric heater for heating air as well as a fan for feeding the heated air into the drying case, a humidity sensor being installed inside the drying case and the humidity level of the abovementioned drying case being measured by the humidity sensor; and

a control circuit for controlling the electric heater and the fan.

3. Detailed Description of the Invention

Industrial Field of Application

The present invention relates to a tableware dryer equipped with an electric heating means, such as an electric heater.

Related Art of the Invention

In commonly utilized tableware dryers, washed tableware that has been set in cases is dried in a short amount of time by means of warm air blown against it.

In the following, a conventional tableware will be described with reference to Figure 3.

Figure 3 illustrates the structure of the conventional tableware dryer. The tableware 8 contained in a dish-draining basket 6 is placed inside a drying case 5 together with a water-receiving pan 7. The bottom part of the drying case 5 is equipped with a bottom case 2, and its top

* Numbers in the margin indicate pagination in the foreign text.

part is equipped with a case lid 10. The front side of the bottom case 2 is provided with an operation part 1, and the bottom case 2 has built inside it an air-feeding part 2, which is composed of a fan and a fan motor, and a heater part 3, which is composed of an electric heater.

Moreover, the bottom case 2 is provided with an air inlet 2a, the area between the bottom case 2 and water-receiving pan is provided with an air-blowing port 2b, and the case lid 10 is provided with an outlet 10a.

The operation of the tableware dryer having the above structure will be explained below.

First, when the switch of the operation part 1 is turned on, the air-feeding part 3 suctions air outside the apparatus body from the inlet 2a of the bottom case 2 as indicated by the arrow in the figure and subsequently feeds it to the heater part 4. The fed air becomes heated at a high temperature and turned into hot air in the heater part 4, and is then fed through the air-blowing port to the drying case 5. After warming the tableware 8 contained inside the drying case 5, it turns into warm air and becomes discharged to the exterior of the apparatus from the outlet 10a provided to the case lid 10. In this manner, by blowing hot air /2 against the tableware 8, the water droplets attached to the tableware 8 become evaporated, and this shortens the drying time of the tableware 8 as a result. In this case, the user, based on general drying times, determines the drying time by setting the timer on the operation part 1.

Problem(s) that the Invention is to Solve

In the conventional structure described in the above, the drying time cannot be consistent since the types and quantity of the dishes placed in the tableware dryer are different everyday, and there tend to be discrepancies between the planned drying times and actual drying times.

If the set time is too short, the dishes will not be dry enough and need to be dried again, and if the set time is too long, the dishes will be dried longer than necessary, resulting in wasted power.

Means for Solving the Problem(s)

To achieve this aim, the present invention is equipped with an electric heater for heating air as well as a fan for feeding the heated air into the drying case. A humidity sensor is installed inside the drying case, the humidity level of the abovementioned drying case is measured by the humidity sensor, and a control circuit is equipped to control the electric heater and the fan.

Operation of the Invention

This structure enables the humidity sensor to detect the humidity level inside the drying case, to sense the time that the dishes became completely dry based on the relationship between the humidity level and the degree of the dryness of the dishes, and to thus stop the operation of the tableware dryer automatically.

Embodiment of the Invention

In the following, one embodiment of the invention will be described with reference to Figure 1 and Figure 2.

Figure 1 illustrates the structure of a tableware dryer of the present invention. Since the structure is exactly the same as that of the

conventional example except for the humidity sensor 9 and control circuit 1a, the identical components will be denoted by the same numerals and will not be explained.

The humidity sensor 9 is attached to an upper part of the bottom case 2 on the opposite side from the warm-air blowing outlet 2b and is also connected to the control circuit 1a. The control circuit 1a receives the signals detected by the humidity sensor 9 and controls the electric heater 4 and fan 3.

The operation of the tableware dryer of this embodiment having the above structure will be described based on the graph in Figure 2.

First, washed dishes 8 are placed inside the tableware case 5. Then, the switch on the operation part 1 is turned on to blow air that has been heated by the electric heater 4 against the dishes 8 by means of the fan 3.

When the humidity level detected by the humidity sensor 9 became 30% or less in terms of relative humidity, power stops being fed to the electric heater 4 and fan 3. This is because it has already been confirmed that the dishes 8 have finished being dried by the time the relative humidity level inside the drying case 5 became 30% or less, as illustrated in Figure 2.

Moreover, the humidity sensor 9 is installed on the opposite side from the side provided with the blowing outlet 2b so that it will not be affected by the warm air fed from the warm-air blowing part 2b, as illustrated in Figure 1.

As described in the above, according to this embodiment, the

operations of the humidity sensor 9 and control part 1b lead to the detection of the humidity level inside the drying case 5, and the power is automatically turned off from being supplied to the electric heater 5 and fan 3 by judging the degree of dryness of the dishes 8. As a result, the drying operation can be carried out only for an optimum amount of time, and this prevents insufficient drying and excessive drying from occurring.

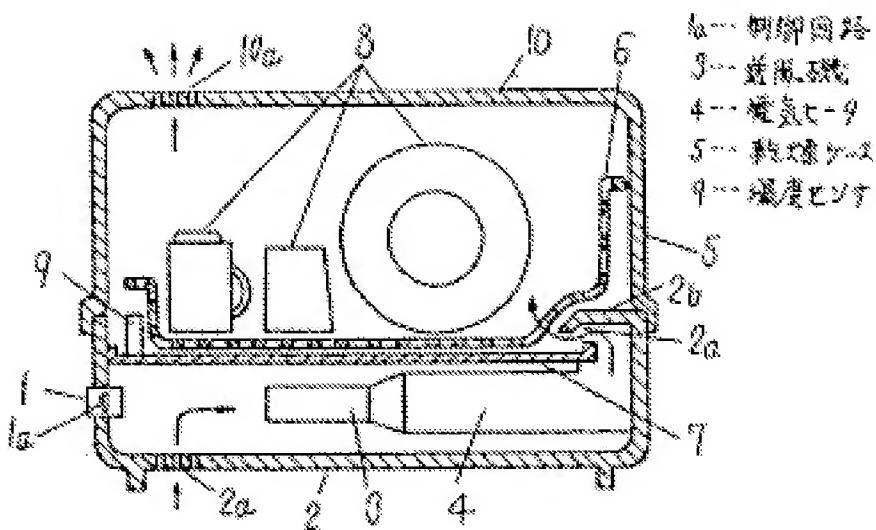
Effects of the Invention

As is clear from the above description of the embodiment, the present invention makes it possible to know the degree of dryness of the dishes by means of a humidity sensor and to supply power to the electric heater and fan for only as long as it is required for the dishes to dry. Therefore, it can realize an excellent tableware dryer capable of achieving the effect of greatly reducing power consumption.

4. Brief Description of the Drawings

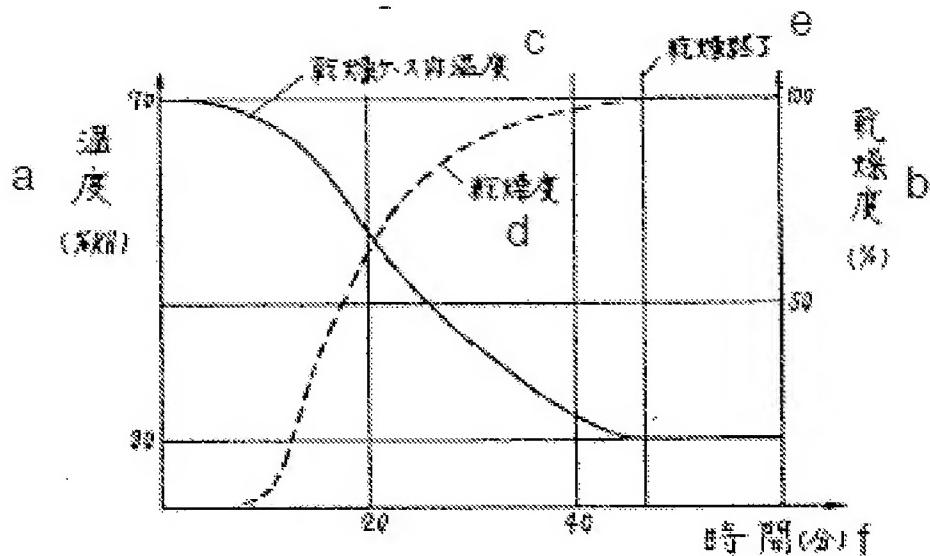
Figure 1 is a cross-sectional drawing of the tableware dryer of one embodiment of the present invention. Figure 2 is a characteristics graph indicating the changes in the dryness level of the dishes. Figure 3 is a cross-sectional drawing of a conventional tableware dryer.

1a = control circuit; 3 = fan; 4 = electric heater; 6 = drying case; 9 = humidity sensor. /3



Key: 1a) control circuit; 3) fan; 4) electric heater; 5) drying case;
9) humidity sensor

Figure 1



Key: a) humidity level (%RH); b) dryness level (%); c) humidity level inside drying case; d) dryness level; e) end of drying; f) time (min.)

Figure 2

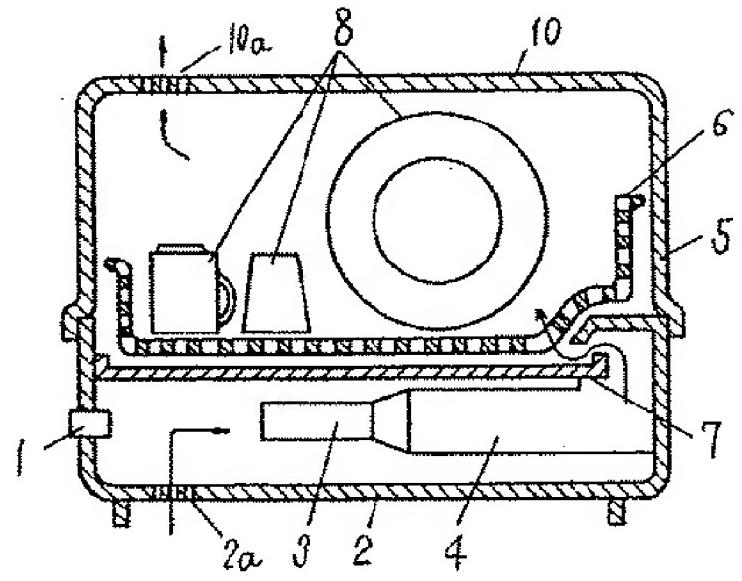


Figure 3